

CLAIMS

1. An electro-chemical sensor comprising at least two redox systems sensitive to the same species.
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2. The sensor of claim 1 wherein the species are protons.
3. The sensor of claim 1 wherein the at least two redox systems have a maximum or peak redox reaction at different voltages.
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4. The sensor of claim 1 wherein the at least two redox systems are mounted onto the same conductive substrate.
5. The sensor of claim 4 wherein the at least two redox systems are mounted onto a carbon-based substrate.
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6. The sensor of claim 5 wherein the at least two redox systems are mounted onto a carbon powder substrate.
- 20 7. The sensor of claim 5 wherein the at least two redox systems are mounted onto a diamond-based substrate.
8. The sensor of claim 7 wherein the at least two redox systems are mounted onto a multi-walled nanotube-based substrate.
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9. The sensor of claim 1 comprising a detector adapted to measure the redox potential of said at least two redox system in the presence of the species and to convert measurements into an signal indicative of the concentration of said species.
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10. An electro-chemical sensor for determining the concentration of a molecular species in a fluid comprising a first redox system sensitive to said species and a second redox system sensitive to said species;
35 voltage supply and electric current detector to perform voltammogramic measurements;

and an analyser to detect relative shifts in said voltammogramic measurements.

11. A downhole tool for measuring characteristic parameters of wellbore effluents comprising an electro-chemical sensor in accordance with claim 1.
12. A downhole formation sampling tool for measuring characteristic parameters of wellbore effluents comprising an electro-chemical sensor in accordance with claim 1.
13. A downhole tool for measuring characteristic parameters of wellbore effluents comprising an electro-chemical sensor in accordance with claim 1 mounted onto a permanently installed part of the wellbore.